4.1.3. CALIBRATION OF DOBSON SPECTROPHOTOMETERS

Seven Dobson ozone spectrophotometers in the CMDL network, as well as eight others, were calibrated during 2000 and 2001. Table 4.3 lists all the instruments calibrated and the resulting calibration difference expressed as a percent ozone difference. This percent difference is between the ozone calculated from the test and from the standard instrument, using the measurements based on the most common observation type (ADDSGQP). The value is then averaged over μ (optical path length through the atmosphere, calculated from solar zenith angle) values of 1, 2, and 3, and normalized to a total ozone value of 300 Dobson units (DU). This number represents the instrument measurement status before any repair or calibration adjustment is made. The table also lists the location of the calibration and the standard instrument used. The Boulder station instrument is normally compared with the standard whenever intercomparisons are made. The MLO station instrument is compared with the Primary Standard (D083) each summer. The Primary and Secondary Standards are compared twice yearly. These instruments are maintained to within ±1% of the Primary Standard.

CMDL participated in international Dobson spectrophotometer calibrations at the South African Weather Bureau in Pretoria, South Africa, in 2000 and at Lauder, New Zealand, in 2001 as part of its role as the World Center for Dobson Calibrations. The Japanese regional standard Dobson instrument was calibrated at MLO during August-September 2001.

TABLE 4.3. Dobson Ozone Spectrophotometers Calibrated in 2000-2001

Station	Instrument Number	Original Calibration Date	Calibration Correction (%)	Standard Number	Place
		2000			
Tamanrasset, Algeria	11	July 22, 1993	+2.4	65	Pretoria, South Africa
Maun, Botswana (proposed)	15	N/A	N/A	65	Pretoria, South Africa
University of Nairobi, Kenya	18	March 7, 1995	-0.2	65	Pretoria, South Africa
Seychelles	57	1988	+2.0	65	Pretoria, South Africa
Irene, South Africa	89	February 12, 1997	-0.8	65	Pretoria, South Africa
Springbok, South Africa	132	February 11, 1995	Calibration broken	65	Pretoria, South Africa
Lagos, Nigeria	5703	July 22, 1993	+4.4	65	Pretoria, South Africa
Admunsen-Scott, Antarctica	82	N/A	N/A	83	Boulder, Colorado
		2001			
Bismarck, North Dakota	33	April 27, 1995	+0.7	83	Boulder, Colorado
Caribou, Maine	34	October 5, 1995	+0.3	65	Boulder, Colorado
Nashville, Tennessee	79	October 3, 1995	+1.0	83	Boulder, Colorado
Samoa	42	February 1997	-1.1	83	Lauder, New Zealand
Lauder, New Zealand	72	February 1997	+0.2	83	Lauder, New Zealand
Perth, Australia	81	February 1997	+0.9	83	Lauder, New Zealand
Melbourne, Australia (regional standard)	105	February 1997	0.0	83	Lauder, New Zealand